

## Clayton Valley Groundwater Basin

- Groundwater Basin Number: 2-5
- County: Contra Costa
- Surface Area: 17,840 acres (28 square miles)

### Basin Boundaries and Hydrology

The Clayton Valley Groundwater Basin is located in northern Contra Costa County along the south shore of Suisun Bay. The basin is about 40 miles northeast of San Francisco. It is bounded by Suisun Bay on the north, Mt Diablo Creek on the east, the Concord Fault on the west, which divides this separates this basin from the Ygnacio Valley groundwater basin, and the foothills of Mount Diablo on the south. The cities of Concord and Clayton overlie the Clayton Valley Basin. The Clayton Fault, Contra Costa Canal, Concord Naval Weapons Station and the US Naval Weapons Station are also part of the basin. Marsh Creek flows through the basin before emptying into the Suisun Bay. Both the Sacramento and San Joaquin Rivers drain into the Suisun Bay from the east.

The topography of the area consists of gently sloping lowlands and hilly terrain ranging in elevation from sea level to 400 feet. The floor of the valley slopes gently to the northwest. Average annual precipitation in the basin ranges from 16 to 18 inches.

### Hydrogeologic Information

#### ***Water Bearing Formations***

Clayton Valley is underlain by thick alluvial deposits which cover a faulted and folded complex of consolidated Cretaceous and Tertiary rocks. The water bearing units in the basin can be found in the Recent alluvium and the older alluvium valley fill deposits. The combined thickness of these deposits exceeds 700 feet. Aquifers in the basin area are hydrologically connected to Suisun Bay (DWR 1975). There are limited data regarding the occurrence and movement of ground water in the basin.

**Quaternary Alluvium.** Unconsolidated Quaternary alluvium and semi-consolidated Tertiary-Quaternary deposits with interbedded lenses of clays, sands, and gravels contain the main groundwater supply. These deposits can be found exposed in the southern portion of the basin (DWR 1959).

**Alluvium.** Modern alluvial sediments are located along the Suisun Bay shoreline of the basin. These sediments are characterized by soft, water-saturated muds, peat and loose sands (CCCPD 1975). They become progressively finer toward Suisun Bay.

#### ***Groundwater Level Trends***

Hydrographs created from DWR well data in the Clayton Valley Groundwater Basin indicate that groundwater levels have shown a slight gradual decline over the period of record. The depth to groundwater is generally greatest in summer months and shallowest in winter months. The 1976 - 1977 and 1987- 1992 drought periods showed groundwater level dropped and subsequent recovered. While groundwater elevations in the

eight wells examined are not indicative of elevations in all wells within the basin they can be used to infer relative changes in groundwater levels within the basin.

### **Groundwater Storage**

**Groundwater Storage Capacity.** No published groundwater storage capacity data for the basin was found.

**Groundwater in Storage.** No published groundwater in storage data for the basin was found.

### **Groundwater Budget (Type C)**

Due to lack of groundwater budget data, inflows, including natural, applied, and artificial recharge and outflows including urban and agricultural extraction have not been included.

### **Groundwater Quality**

**Characterization.** Water quality information for the Clayton Valley Groundwater Basin is limited. DWR historic groundwater total dissolved solids values ranged from 328 mg/l to 864 mg/l. The average total dissolved solids concentration for eight wells monitored by DWR was 472 mg/l.

### **Water Quality in Public Supply Wells**

Constituent Group <sup>1</sup>	Number of wells sampled <sup>2</sup>	Number of wells with a concentration above an MCL <sup>3</sup>
Inorganics – Primary	5	0
Radiological	5	0
Nitrates	5	0
Pesticides	5	0
VOCs and SVOCs	5	0
Inorganics – Secondary	5	2

<sup>1</sup> A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

<sup>2</sup> Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

<sup>3</sup> Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

## Well Production characteristics

Well yields (gal/min)		
Municipal/Irrigation		Average: 200 (DWR 1959)
Total depths (ft)		
Domestic	Range: 40 - 605	Average: 217 (based on 15 wells)
Municipal/Irrigation	Range: 80 -540	Average: 209 (based on 10 wells)

## Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	4 well semi annual
Cooperators	Miscellaneous water quality	5 wells biennially
Department of Health Services and cooperators	Title 22 water quality	48 wells

## Basin Management

Groundwater management:	None identified
Water agencies	
Public	Contra Costa Water District, Central Contra Costa Sanitary District, Diablo Vista Water District
Private	

## References Cited

- California Department of Water Resources, Bulletin No. 118-80, Ground Water Basins in California, January 1980.
- California Department of Water Resources, Bulletin No. 130-72, Volume II Northeastern California, December 1973.
- California Department of Water Resources, Bulletin No. 63-5, Sea-Water Intrusion in California, October 1975.
- California Department of Water Resources, Bulletin No. 77-58, Ground Water Conditions in Central and Northern California 1957-58, October 1959.
- Contra Costa County Planning Department, Seismic Safety Element, being a part of the Contra Costa County General Plan, December 1975.
- Jennings, O.P. 1973, Geologic map of California: California Division of Mines and Geology, Geologic Map Series, San Francisco Sheet, scale 1:250,000.
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- Oakeshott, G.O. 1973, Geologic map of Contra Costa County: California Division of Mines, Journal Vol. 54, No. 4, Plate 5.

## Errata

Changes made to the basin description will be noted here.